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I. *Part of a Letter to Dr Mead, concerning Secretions in an Animal Body.* By Jos. Morland, M. D.

— **A**Nd indeed no one who has endeavour-  
ed to explain the manner, by which *Se-  
cretions* are performed, seems to me to have given a satis-  
factory account of that matter; nor do I doubt, but that a  
man of your sagacity and skill in these affairs, can discover  
the defects of the several opinions of the Authors concern-  
ing them.

I shall therefore propose my opinion as briefly as I can.

It seems to me, that the whole Business may be reduced  
to this double enquiry. 1st, How a thin Fluid (such as is  
the *Urine*) may be separated from the Mass of Blood, and  
the remaining parts of the Blood, circulate back to the Heart.  
2dly, How a thick Fluid (such as is the *Bile* or *Semen* for  
example) may be separated from the Mass of Blood, and  
the other Fluids both thinner and thicker than this particu-  
lar Fluid to be separated, circulate back to the Heart. And that  
I may be the more plain, I shall give a general Idea of the  
structure of the Glands. A Gland I conceive to be com-  
posed.

1st, Of the Ramifications of the Blood Vessels inclosed in  
a common Membrane, which sends off several Fibres, by  
which these minute Vessels are tied together; and that the  
Veins are a continuation of the Arteries. Of this Dr *Areskin*  
has fully convinced us, by an injection of Wax in an Human  
Body, so dextrously performed, that the Wax being inject-  
ed by the Arteries filled the Veins at the same time; and af-  
terwards by a nice dissection of the part, where the conti-  
nuation of the small Ramifications of the Arteries and Veins  
appeared to the naked Eye.

2dly,

2dly, I conceive, that when the Branches of the Arteries begin to grow very small, they send off several ducts, whose Orifices are of different Dimensions. These Ducts are of 2 sorts.

*The First* of these, which in the same Artery are always smaller than the 2d, pass immediately from the Artery, and open into the Veins.

*The Second* which pass off nearer to the extremity of the Arteries, unite and carry off a Liquor from the Mass of Blood for particular ends in several parts of the Body. It is to be observed, that in one case the second sort are only to be found.

I imagine, that a thin Fluid may be secern'd from a thick one, when the Orifices of the secretory Ducts are so small, as to admit no other but that thin Fluid, and that at the same time the remaining parts of the Blood which are thicker, continue their course in the Vessel.

Again, I imagine that a thick Fluid may be secern'd, when the thinner parts are carried off some other way, so that the Liquor to be secerned will be the thinnest of the remaining Mass.

Upon these principles I think it will be easy to explain the Doctrine of Secretions. And now *In the first place* Let us examine how the thinner Secretions are performed: As for instance, the Urine.

When the Blood by the Contraction of the Heart is pushed into the Arteries, they are dilated, which again contracting themselves push it forward into all the parts of the Body, and amongst the rest into the Ramifications of the Arteries of which the Glands of the *Kidneys* are compos'd. By this means the Blood passes by the Orifices of the *Secretory ducts*; when these Arteries contract themselves they press the Blood and force the thinner parts into the Orifices of those Ducts, (which will admit no Thicker Fluid) and carry it toward the *Pelvis* and the remaining part of the Blood, into the Veins, by them to be carry'd back to the Heart. Thus a  
Thin

Thin Liquor may be separated from the Mass of Blood

*In the Second Place* Let us examine how a Thick Liquor may be separated from the Mass of Blood where thinner Liquors are mixt with it.

For instance, let us take the *Gall* or *Semen*.

When the Blood is pusht into the *Celiac* or *Mesenteric* Arteries, 'tis forced to pass into the Glands of the *Stomach*, *Pancreas*, *Spleen* and *Intestines*, &c. where the *Liquor Gastricus*, *Succus Pancreaticus*, *Liquor intestinalis*, are separated by the above-mention'd method. The Blood thus robb'd of various thin Liquors is push'd on into the Veins, which answer to these Arteries, which Veins unite, and form a large Trunc called the *Vena Porta*, which entering into the substance of the Liver, by its small Ramifications chiefly forms the Glands of which the Liver is compos'd. Here again all the Fluids contain'd in the *Vena Porta*, which are thinner than the Bile; are separated from this Mass of Blood by the first sort of Secretory Ducts ( which we said opened into the Veins ) and there are discharged and mixt with the Blood, which is passing toward the Heart, At the same time the *Bile*, with the rest of the Blood which is thicker, continues its course in the Artery : Now all the thin Liquors being separated the Bile is the thinnest part of this Mass of Blood, and so may be received by Excretory Ducts, which are capable to receive it, and no other.

The *Semen* being a very thick Liquor is separated much after the same manner. *viz.* The Blood being pusht into the *Spermatick* Arteries, passes into the substance of the *Testicles*, where all the Liquors that are thinner than *that* out of which the *Semen* is to be taken are separated by the first sort of Secretory Ducts, and carried back to the Mass of Blood. Then this *Liquor Seminalis* being the thinnest part of the remaining Mass is separated by Excretory Ducts, capable to receive it and no other. After the *Liquor Seminalis* is separated from the Mass of Blood by the aforesaid method, it is pusht forward into the Excretory Ducts, where there are other Ducts, which take their origin all along from them,  
which

which Ducts are capable to receive the thinnest parts of the Liquor *Seminalis*, and convey them to the Mass of Blood ; and thus the *Semen* is left behind to pass into the *Vas deferens*.

And 'tis worth remarking, that as the *Semen* grows thicker and thicker by continual separation, the Canal in which it is to run, grows larger and larger, as appears by the structure of the *Testicles Epididymis* and *Vas Deferens*. Hence we may give a true account, why the Canals of which the Testicles are composed, are so long. *viz.* That there might be time enough to separate all the thin Fluids.

By this method we see, how the thickest and thinnest Fluids may be separated from the Mass of Blood. And how intermediate Liquors may be separated after the same manner by Canals of intermediate Dimensions.

Thus in a word the whole Doctrine of Secretions may be reduc'd to this.

To separate a Liquor of any determin'd thickness, all the Fluids, which are thinner, must be carry'd off by small Canals, and the Liquor to be separated, being the thinnest of the remaining Mass is secerned, because the Ducts are capable to receive it and no other.

## Corollarys.

1. Hence the use of the Spleen is evident.
2. Hence appears the origin and use of the Lymphaticks.
3. Hence the Texture and use of many minute parts of the Body may be discovered, which hitherto has been unknown.

You know, Sir, of how great moment such considerations as these are to the knowledge both of the Cause and Cure of many Distempers ; having already in some degree convinc'd those, who are the only capable Judges of these matters, that *Mechanical Enquiries* into the Animal Oeco-

nomy, are the best Foundation, upon which we can safely proceed in the Practice of Physick.

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II. *An Abstract of part of a Letter from Dr Bonomo to Signior Redi, containing some Observations concerning the Worms of Humane Bodies.* By Richard Mead, M. D.

**H**AVING frequently observed that the Poor Women when their Children are troubled with the *Itch*, do with the point of a Pin pull out of the Scabby Skin little Bladders of Water, and crack them like Fleas upon their Nails; and that the Scabby Slaves in the *Bagno* at *Legborne* do often practice this Mutual Kindness upon one another; it came into my Mind to examine what these *Bladders* might really be.

I quickly found an *Itchy* person, and asking him where he felt the greatest and most acute *Itching*, he pointed to a great many little *Pustules* not yet Scabb'd over, of which picking out one with a very fine Needle, and squeezing from it a thin Water, I took out a very small white *Globule*, scarcely discernible: Observing this with a Microscope, I found it to be a very minute Living Creature, in shape resembling a Tortoise, of whitish colour, a little dark upon the Back, with some thin and long Hairs, of nimble motion, with six Feet, a sharp Head, with two little Horns at the end of the Snout; as is represented in Fig. 1 and 3.

Not satisfied with the first Discovery, I repeated the search in several *Itchy* persons, of different Age, Complexion and Sex, and at differing seasons of the year, and in all found the same Animals; and that in most of the Watery Pustules,